

*File In
p.d.E.*

15 August 1961

MANUFACTURE AND USE OF TEST TARGETS

PROBLEM:

The problem consists of determining a technique by which system performance can be objectively determined.

BACKGROUND:

The determination of system performance by visual inspection of the photographed terrain or square-wave resolution targets is influenced by the perceptive and interpretive capabilities of the inspector. Likewise, it is extremely difficult to visually determine image quality differences of small magnitude.

Frequency response measurements using sine-wave target images and a microdensitometer yields accurate and unambiguous data. System performance so evaluated will enable small and large image quality differences to be detected and their magnitude determined. In addition to determining the limiting capability of the system to record fine detail, as is the case in "resolving power" determinations, frequency response measurements will yield data regarding less-than-limiting system capabilities. The outstanding feature of frequency response measurement is that it is objective.

PROPOSAL:

It is proposed that targets be manufactured and used during local and area system flight testing. These targets should be such that frequency response measurements can be obtained for the monitoring of testing and as an unambiguous quality control tool.

ALTERNATIVE:

25X1A

An alternative is to use existing resolution targets at . However, it is extremely likely that images of such targets are unsuitable for microdensitometry. The physical location of existing targets may possibly be such that the location of target images within a single negative yields unsuitable coverage and thus requiring several vehicle passes over the targets. This alternative does not provide targets for local flight tests. Further, the existing targets are in poor physical condition, we believe.

Another alternative is to use no targets, which is very little different from the first alternative. As we see it, this will result in system flight testing where our ability to determine the level of performance will be insensitive to small system changes.

Manufacture and Use of Test Targets, Page 2

COST, MANPOWER, SCHEDULE:

The cost of manufacture of the proposed targets is estimated at \$12,800. 80% of the planning, designing, testing, and locating potential vendors has been completed; therefore, the completion of the remaining tasks will require a minimum of man hours of project personnel (about 3 weeks technician and 1 week engineer). The targets could be completed during October, 1961.

RECOMMENDATION:

In view of the available alternative, it is recommended that the proposed test targets be manufactured and used during local and area flight testing.

mb

14 August 1961

SUMMARY OF ESTIMATED COSTS

TEST TARGETS

One primary layout, 5 secondary layouts, and 16 sphere layouts

Fiberglass	\$7,000.00
Printing	\$4,000.00
Boxes	\$1,000.00
Handling, etc.	<u>\$ 800.00</u>
	\$12,800.00
Aluminum frames	\$9,000.00

mb

14 August 1961

PRINTING OF TARGETS

PROBLEM:

The most exacting and difficult task of the target manufacture is the printing of the pattern on the fiberglass sheets. A large portion of the printing cost is due to press-changes while the smaller portion of the cost is due to the number of panels printed.

We can only at this time make an estimate of the required number of panels, including spares. However, it may be found necessary, later, to have available additional panels. The cost of printing of additional panels is greater in the future than it is now.

PRINTING COSTS:

One set now: \$4,000.00
One set later: \$4,000.00

Two sets now: $\$4,000.00 + 2,400 = 6,400.$

Three sets now $\$4,000.00 + 2,400 + 2,400. = 8,800.$

SUGGESTED ACTION:

It is suggested that one set, as listed on the attached sheet, be printed at this time.

mb

TOTAL 444

PANEL REQUIREMENTS

mb

14 August 1961

TARGET PANEL FRAMINGBACKGROUND:

It was decided to use fiberglass or phenolic sheets (1/16" thick) as a base for the targets, because of its good weathering and light weight characteristics. Because twelve adjacent panels together compose one target, the somewhat flexible panels should be displayed with edges in register and with flat surfaces.

It is planned to display the panels only during the days on which flight tests occur. On other days the panels will be stored in boxes. Security and panel lifetime are the factors considered.

PROBLEM:

To achieve edge register and surface flatness, one of two methods can be employed:

1. Attached to each panel is a light weight aluminum frame. The unit is placed on a flat surface, or on posts imbedded in a rough surface. The thickness of each panel is increased from 1/16" to 1 inch.
2. The panels are not attached to a frame, but instead are placed on a frame which is imbedded in the ground. The panels are stored in boxes, and the frames remain in the ground.

ADVANTAGES-DISADVANTAGES:

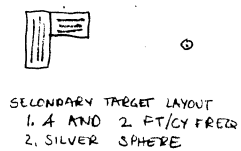
	Estimated Cost (Framing Only)	Number of Boxes	Total Weight of Boxes	Size of Boxes	Weight Per Panel
Frames Attached to Panels	\$9,000.--	9	5300 lbs	7-4'x4'x8' 2-4'x3'x8'	16 lbs
Frames Imbedded in Ground	\$5,000.--	8	3380 lbs	1-4'x4'x8' 1-4'x4'x4' 6-4'x4'x2"	10 lbs

Target Panel Framing, Page 2

SUGGESTED ACTION:

It is suggested (1) that frames not be constructed at this time, (2) that all panels (except those needed for local flight testing) be shipped to the area, interleaved with cardboard in boxes, (3) that the area be surveyed for possible display locations, such as concrete runways requiring no framing whatsoever and flat and rough terrain locations requiring individually suited framing.

mb



SECONDARY TARGET LAYOUT
1. 4 AND 2 FT/CY FREQ
2. SILVER SPHERE

SECONDARY TARGET LAYOUT
1. 1 AND 1.5 FT/CY FREQ
2. SILVER SPHERE

SECONDARY TARGET LAYOUT
1. 4 AND 2 FT/CY FREQ
2. SILVER SPHERE

SECONDARY TARGET LAYOUT
1. 4 AND 2 FT/CY FREQ
2. SILVER SPHERE

PRIMARY TARGET LAYOUT
1. FOUR FREQUENCIES
2. GRAY SCALE
3. RECOGNITION TARGET
4. SILVER SPHERE

SECONDARY TARGET LAYOUT
1. 4 AND 2 FT/CY FREQ
2. SILVER SPHERE

○ = SILVER SPHERE

OVERALL TARGET LAYOUT

